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the subversion of the intentions of Stewart, Tilden, Fayerweather and others would thus be rendered impossible.—EDITOR.]

SHORTER ARTICLES.

SLEEPY GRASS AND ITS EFFECT ON HORSES.

In the Pecos Valley of New Mexico a year ago, a ranchman told me of a strange kind of grass found in the Sacramento Mountains west of there which, from its peculiar effect on horses, is called 'sleepy grass.' He described it as differing from the locoes in merely putting horses into a deep sleep without other symptoms of poison.

The story had a far-away sound and made little impression at the time, but last September, as I was traveling along the crest of the Sacramento Mountains, it came back to me with a new interest.

We had made camp one evening in a beautiful park, bordered with spruces and firs, and covered with tall grass that, with its green base leaves and ripe heads loaded with heavy rye-like grain, offered a tempting feast to our hungry animals. The moment saddles and harness were off, the horses were eagerly feeding. A few minutes later a passing ranchman stopped his team and called over to us, 'Look out there! Your horses are getting sleepy grass,' and added, 'If they get a good feed of that grass you will not get out of here for a week.' We were not prepared to spend a week in that locality, but I was anxious to test the grass, so let the horses feed for a half hour, then brought them up for their oats and picketed them on some short grass on a side hill well out of reach of the sleepy grass.

The following morning just after sunrise the cook called my attention to the attitude of one of the team horses, saying there was 'sure something the matter with old Joe.' The horse was standing on the side hill, asleep, his feet braced wide apart, head high in air, both ears and under lip dropped, a most ridiculous picture of profound slumber. The other horses apparently had not eaten as much of the grass as old Joe, for they were merely dozing in the morning sun and showed signs of life in an occasional shake of the head or switch of the tail. At breakfast time the

others woke up to a keen interest in their oats, but old Joe, after being dragged to camp much against his will, preferred to sleep rather than eat, and after pulling back on his rope all the way down to the spring, refused to drink or even lower his head to water. My little saddle mare showed the least signs of the general stupor, so dropping behind with her, I woke the others up pretty thoroughly and brought them into camp on a lopé. Later, when in the harness, the team traveled along steadily with some urging, but when we reached Cloudcroft and left the horses in front of the store while getting supplies, their heads dropped, and for an hour they slept soundly. Even my nervy little mare did not move from her tracks, but stood with drooping ears, paying no attention to the unusual surroundings and stir of a town. On starting again the saddle horses responded to the spurs with worried switches of the tail quite different from their usual manner, while the team paid no greater attention to the whip. For the rest of the day our progress was slow, notwithstanding which, the driver called my attention to the fact that the team, and especially old Joe, were sweating profusely. Our saddle horses would sigh with relief when allowed to stop for a moment, and we had many a good laugh at the flapping ears of my companion's horse—a large-eared, raw-boned cayuse which seemed to have lost all control of her usually erect ears.

That night we camped in another park-like valley where sleepy grass was abundant, but took care to picket the horses out of reach of it. They were hungry and all began to feed eagerly, but old Joe soon stopped, braced his feet and relaxed into forgetful slumber. The next morning when we went to bring them in for their grain all were fast asleep.

The stupor lasted about three days, and was too evident and unusual to be attributed to weariness or natural indisposition. We were making easy trips and the horses were in good condition. After it wore off they showed their usual spirit and energy, as well as appetite. The only after-effect was a gaunt appearance, apparently resulting from lack of

energy to get their usual amount of grass. Old Joe had even refused his grain for about half the time.

It should be remembered that our horses had but a small amount of the grass. The ranchmen told us that other travelers coming into the country had been obliged to camp for a week while their horses slept off the effect of a good feed of it, and while its effects usually lasted for a week or ten days, it did no more serious damage than to leave the animals thin from fasting. Stories were told of horses being lost in the mountains and found several days later in the bushes near camp fast asleep.

I have offered no real proof that this particular species of grass is what affected our horses. They undoubtedly ate a dozen other species of grass, as well as some other plants, every day while we were in the mountains. But after our experience I am inclined to give credit to the uniform statements of the ranchmen in regard to it. All agree on the species, on its effects, and to the fact that after one good dose of sleepy grass, horses will never touch it again. This latter statement has ample proof. Horses and cattle are ranging in many of the valleys where it grows in abundance, untouched and full of ripe seed, while the other grasses are cropped close all around it. I did not see horses or cattle touch it except in the case of our own animals and the team of another traveler from the valley, all of which ate it eagerly. They ate both the base leaves and the heads that were full of ripe seeds. I shelled out and ate a handful of the seeds, but without noticeable effect. The ranchmen generally agree that it is the leaves which produce the sleepiness.

I did not hear that cattle were affected by it, but they certainly avoid it, as many were grazing near where it stood untouched.

While this experience was new to me, I find that sleepy grass has long been known to botanists as such, or technically as *Stipa vaseyi*. Something has been known of its effects on horses, but apparently its chemical properties have not yet been determined.

VERNON BAILEY.

THE VERTEBRAL COLUMN OF BRONTOSAURUS.

ALTHOUGH the genus *Brontosaurus* Marsh has been known from the greater part of the skeleton for more than twenty years, many points of interest concerning its structure remain undetermined. The Field Columbian Museum Expedition of 1900 was fortunate in securing a large part of a skeleton of one of these great reptiles in such a state of preservation that the bones of the torso and base of the tail were scarcely disturbed from their relative positions. This splendid specimen, which is now almost ready for exhibition, makes it possible to determine the vertebral formula of the thoracic and anterior caudal regions, as well as many other minor features.

The specimen consists of eleven presacral vertebrae, five coalesced sacral, and twenty-three caudal vertebrae, with pelvis, ribs and chevrons almost intact. The eleventh presacral was exposed and partially broken away when found. From that point backward the thoracic, sacral and caudal vertebrae, as far as caudal XIII., were lying in a close series, with their centra nowhere displaced more than two or three inches. Most of the ribs and many of the chevrons were also found in position.

The specimen throughout agrees very closely, both in size and in character, with Marsh's type, *Brontosaurus excelsus*. However, it shows that with regard to the thoracic region his final restoration was considerably at fault. In fact his first figure* shows the thorax much more nearly correct. Counting the five coalesced vertebrae as sacral, the thoracic series in this specimen is made up of ten rib-bearing vertebrae. The eleventh, as before stated, has been partially lost, but enough remains to show that the transverse process is replaced by a cervical rib. A noticeable reduction in size of the rib facets on presacral X together with the much-reduced neural spines on presacral XI., bears out the conclusion that the latter is the posterior cervical. We may, therefore, conclude that the number of thoracic vertebrae in this genus is ten instead of fourteen as estimated by Marsh.

The crest of the dorsal arch was evidently

* *Am. Jour. Sci.*, Vol. XXVI., pt. I.